16

WHAT IS CLAIMED IS :

      1.   An automatic process of color restoration of a silver image (3) whose color is altered with regard to the original color of said silver image (3), the color alteration not occurring evenly, spatially in the plane of the image, and

5   according to a direction parallel to one main axis (19) of the image; said process comprises the following steps:

      a) digitize the altered silver image by using a measuring scale of optical densities;

      b) filter all the pixels of the digitized image;

10   c) divide the digital image (12) into pixel strips (18) arranged perpendicular to the direction of the main axis (19) of the image according to which the color alteration occurs, the joining of all the pixels of each strip representing all the pixels of the digital image;

      d) calculate, for each pixel strip, and for each of the color channels

15   (40), (50), (60) forming the image, a distribution of the optical densities of the pixels forming said strip;

      e) calculate, for each of said distributions of step d), a top crude reference value of optical density (36), and a bottom crude reference value of optical density (37);

20   f) calculate, from all the top and bottom crude reference values of step e), respectively the corresponding top filtered reference values of optical density (46) and bottom filtered reference values of optical density (47);

      g) determine, from the top and bottom filtered reference values of

25   optical density of step f), respectively the top reference curves of optical density (42) and bottom reference curves of optical density (43), said reference curves being representative of the color degradation profile of the image;

      h) determine, for each of the color channels forming the image, and

30   from the maximum value of optical density (46M), (56M), (66M) of the top

17

reference curve of optical density (42), the pixel strip of least degradation (44M), (54M), (64M);

i) apply to each pixel strip (44), (54), (64) of the digital image other than the pixel strip of least degradation (44M), (54M), (64M), and to each of the color channels forming the image, a linear transformation enabling the transformation of the optical density filtered values (46), (56), (66), (47), (57), (67) placed on the top reference curve (42), (52), (62) and on the bottom reference curve (43), (53), (63) of optical density of said each pixel strip (44), (54), (64), respectively into top (46M), (56M), (66M) and bottom (47M), (57M), (67M) values of optical density of the pixel strip of least degradation.

2.   The process according to Claim 1, wherein the initial filtering of the altered digital image is performed by using mathematical morphology operators of the type order opening (n) followed by order closing (n), (n) being an integer.

3.   The process according to any one of Claims 1 or 2, wherein top filtered reference values of optical density (46), (56), (66), and bottom filtered reference values of optical density (47), (57), (67), are calculated by using a filtering of the image (12) by the method of following the maxima in each pixel strip (18).

4.   The process according to any one of Claims 1 to 3, wherein the digital image (12) is divided into pixel strips (18) according to adjacent parallel strips having no common pixel between them.

5.   The process according to any one of Claims 1 to 3, wherein the digital image (12) is divided into pixel strips (18) according to parallel strips partially overlapping by twos according to at least one row of pixels.

18

6.   The process according to any one of the previous claims, wherein the top (36) and bottom (37) crude reference values of optical density correspond respectively to the optical density distribution curves (31), (32) placed in the neighborhood of the maximum (30) and minimum (34) optical density

5   curves of said distribution.

7.   The process according to any one of the Claims 1 to 5, wherein the top (39) and bottom (38) crude reference values of optical density correspond respectively to the maximum (30) and minimum (34) optical density

10   distribution curves of said distribution.

8.   The process according to any one of the previous claims, wherein the strip of least degradation (44M), (54M), (64M) is a pixel strip of the image comprising the pixel of maximum optical density value (46M), (56M),

15   (66M) of the top reference curve of optical density (42), (52), (62).

9.   The process according to any one of the Claims 1 to 7, wherein the strip of least degradation is the pixel strip comprising a single row of pixels, said strip passing through the center (20) of the image (12).

20
        10.   The process according to any one of the previous claims, wherein the planes of the color channels forming the image are the red, green and blue ones.